1 stepped pressure equilibrium code : pj00aa

Contents

1.1 outline

1. Checks pressure balance across arbitrary surface.
2. The geometry of the interface, $\mathbf{x}(\theta,\zeta)$, is given, where θ and ζ are arbitrary angle parameters.
3. The "surface potential", $f(\theta,\zeta) = I\theta + G\zeta + \tilde{f}(\theta,\zeta)$, is given, where I and G are constants and $\tilde{f}$ is periodic.
4. The covariant components of the field are determined by

$$B_\theta = \partial_\theta f, \tag{1}$$
$$B_\zeta = \partial_\zeta f, \tag{2}$$
$$B_s = (-g^{s\theta}B_\theta - g^{s\zeta}B_\zeta)/g^{ss}, \tag{3}$$

   where we have assumed that $B^s = 0$.
5. The choice of geometry determines the metrics, and we may have:
   - `Lgeometry.eq.1` : Cartesian : $\mathbf{x} = \theta\,\hat{\mathbf{i}} + \zeta\,\hat{\mathbf{j}} + R(s,\theta,\zeta)\,\hat{\mathbf{k}}$;
   - `Lgeometry.eq.6` : toroidal : $\mathbf{x} = R(s,\theta,\zeta)\,\hat{\mathbf{R}} + Z(s,\theta,\zeta)\,\hat{\mathbf{k}}$;
6. The expresion for B^2 can be written

$$B^2 = \frac{g_{\zeta\zeta}B_\theta B_\theta - 2g_{\theta\zeta}B_\theta B_\zeta + g_{\theta\theta}B_\zeta B_\zeta}{g_{\theta\theta}g_{\zeta\zeta} - g_{\theta\zeta}g_{\theta\zeta}} \tag{4}$$

pj00aa.h last modified on 2012-03-28 ;